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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Murali R. Krishnan

Patent No.: 6,961,341

Issue Date: November 1, 2005

Customer No.: 22971

Title: ADAPTIVE BANDWIDTH THROTTLING FOR NETWORK SERVICES

Attn: Certificate of Correction Branch
Commissioner for Patents
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Alexandria, VA 22313-1450

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Customer Number: 22971

By: /Sung T. Kim/
Attorney Name: Sung T. Kim
Reg. No.: 45,398

CERTIFICATE UNDER 37 CFR § 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Attn: Certificate of Correction Branch, Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450, on this 29th day of July 2009.

Christine Hartness

Christine Hartness

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AUG 05 2009
of Correction*

IN UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Murali R. Krishnan

Examiner: Pizarro, Ricardo M

Patent No.: 6,961,341

Group Art Unit: 2661

Issue Date: November 1, 2005

Confirmation No.: 3155

Customer No.: 22971

Docket No: 35671.02

Title: ADAPTIVE BANDWIDTH THROTTLING FOR NETWORK SERVICES

REQUEST FOR CERTIFICATION OF CORRECTION

Attn: Certificate of Correction Branch
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

It is requested that a Certificate of Correction be issued correcting printing errors appearing in the above-identified United States patent. Two copies of the text of the Certificate in the suggested form are enclosed.

Pursuant to 1.20(a), the examiner is authorized to charge the Certificate of Correction fee of \$100.00 to the Deposit Account No. **50-0463**.

Issuance of the Certificate of Correction would neither expand nor contract the scope of the claims as properly allowed, and re-examination is not required.

The Examiner is authorized to charge any additional fees or credit overpayment to Deposit Account No. **50-0463**.

Respectfully submitted,

Customer Number: 22971

Date: May 28, 2009

By: /Sung T. Kim/

Attorney Name: Sung T. Kim
Reg. No.: 45,398

CERTIFICATE UNDER 37 CFR § 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Attn: Certificate of Correction Branch, Commissioner for Patents, P.O. Box 1450 Alexandria, VA 22313-1450, on this 29th day of July 2009.

Christine Hartness

Christine Hartness

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**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**

PATENT NO : 6,961,341

DATED : November 1, 2005

INVENTOR(S) : Krishnan

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 8, after "5,418,782 5/1995 Wasilewski....." delete "370/436" and insert - - 370/486 - -, therefor.

On Sheet 4 of 13, in Box 205 (Fig. 4), line 1, delete "Retieves" and insert - - Retrieves - -, therefor.

In column 1, line 21, after "FIG. 1" delete "..".

In column 1, line 23, after "24(2)" delete ";" and insert - - , - -, therefor.

In column 1, line 36, delete "modern-based" and insert - - modem-based - -, therefor.

In column 1, line 60, delete "communicalion" and insert - - communication - -, therefor.

In column 2, lines 4-6, delete "served without network congestion and to also avoid impacting other network servers which may be executing on the same host computer system." and
insert - - served without network congestion and to also avoid impacting other network servers which may be executing on the same host computer system. - -, therefor on line 3 after "to be" as a continuation of the paragraph.

In column 2, line 13, delete "is" before "storing data".

In column 2, line 20, delete "in" and insert - - In - -, therefor.

In column 3, line 8, after "is not" delete "..".

In column 3, line 10, delete "fincctions" and insert - - functions - -, therefor.

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**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**

PATENT NO : 6,961,341

DATED : November 1, 2005

INVENTOR(S) : Krishnan

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 3, line 53, delete "delaving" and insert -- delaying --, therefor.

In column 4, line 10, delete "inctementally" and insert -- incrementally --, therefor.

In column 4, line 13, delete "DESCRIPON" and insert -- DESCRIPTION --, therefor.

In column 4, line 58, delete "fuiction" and insert -- function --, therefor.

In column 5, line 40, delete "fom" and insert -- form --, therefor.

In column 6, line 6, delete "notifv" and insert -- notify --, therefor.

In column 6, line 24, delete "Cl-Cn" and insert -- C1-Cn --, therefor.

In column 6, line 43, delete "Cl" and insert -- C1 --, therefor.

In column 6, line 48, delete "transmrtted" and insert -- transmitted --, therefor.

In column 6, line 52, delete "svstem" and insert -- system --, therefor.

In column 7, lines 31-64, delete "FIG. 5 illustrates in flow diagram form the process used by the bandwidth throttling system BT to regulate the operation of the various network servers NS1-NSm extant on the host computer system P. The bandwidth throttling system BT monitors the operations performed by the asynchronous thread queue ATQ to ascertain the bandwidth utilized by each of the network servers NS1-NSm. The bandwidth throttling system BT consists of two subsystems: a measurement subsystem MS to measure the bandwidth usage for each of the network servers; a control subsystem CS which applies feedback based control to the asynchronous thread queue ATQ to limit the bandwidth used by each network server NS1-NSm. The network operations which are

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CERTIFICATE OF CORRECTION**

PATENT NO : 6,961,341

DATED : November 1, 2005

INVENTOR(S) : Krishnan

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

monitored by the bandwidth throttling system BT are: receive, send, and transmit. file. The measurement subsystem MS, at step 301, monitors not only the operations which are performed by each network server NS1-NSm, but also the data flow rate for each operation, in the form of effective real time bandwidth consumed. The effective real time bandwidth is determined by calculating the bandwidth for each operation which is performed and averaging the bandwidth utilization over the last n operations performed. To limit the complexity, the monitoring subsystem MS does not maintain a complete history of operations, but instead maintains a histogram of bandwidth values for the last most recent n time intervals. These values are accumulated by time stamping the start and end times of each operation. If the operation proceeds to completion, the monitoring subsystem MS calculates the bandwidth by dividing the bytes transferred during the operation by the time interval duration. The resultant bandwidth value is stored, at step 302, in the n last time interval histogram, which set of values is used at step 303 to periodically compute an effective bandwidth for this network server." and
insert -- FIG. 5 illustrates in flow diagram form the process used by the bandwidth throttling system BT to regulate the operation of the various network servers NS1-NSm extant on the host computer system P. The bandwidth throttling system BT monitors the operations performed by the asynchronous thread queue ATQ to ascertain the bandwidth utilized by each of the network servers NS1-NSm. The bandwidth throttling system BT consists of two subsystems: a measurement subsystem MS to measure the bandwidth usage for each of the network servers; a control subsystem CS which applies feedback based control to the asynchronous thread queue ATQ to limit the bandwidth used by each network server NS1-NSm. The network operations which are monitored by the bandwidth throttling system BT are: receive, send, and transmit. file. The measurement subsystem MS, at step 301, monitors not only the operations which are performed by each network server NS1-NSm, but also the data flow rate for each operation, in the form of effective real time bandwidth consumed. The effective real time bandwidth is determined by calculating the bandwidth for each operation which is performed and averaging the bandwidth utilization over the last n operations performed. To limit the complexity, the

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**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**

PATENT NO : 6,961,341

DATED : November 1, 2005

INVENTOR(S) : Krishnan

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

monitoring subsystem MS does not maintain a complete history of operations, but instead maintains a histogram of bandwidth values for the last most recent n time intervals. These values are accumulated by time stamping the start and end times of each operation. If the operation proceeds to completion, the monitoring subsystem MS calculates the bandwidth by dividing the bytes transferred during the operation by the time interval duration. The resultant bandwidth value is stored, at step 302, in the n last time interval histogram, which set of values is used at step 303 to periodically compute an effective bandwidth for this network server. --, therefor on line 32 as a new paragraph.

In column 7, line 45, after "transmit" delete "..".

In column 7, line 55, insert -- all -- before "operations,".

In column 8, line 6, after "(R)" delete ";" and insert --, --, therefor.

In column 8, line 13, delete "varv" and insert -- vary --, therefor.

In column 8, line 58, after "being" delete "..".

In column 9, line 10, delete "is." and insert -- is --, therefor.

In column 9, line 14, after "determines" delete "..".

In column 9, line 17, after "actions" delete ",".

In column 9, line 19, after "process" delete "..".

In column 9, line 43, after "(B)" delete "..".

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**UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION**

PATENT NO : 6,961,341

DATED : November 1, 2005

INVENTOR(S) : Krishnan

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 9, line 46, delete "(B-δ)" and insert - - (B+δ) - -, therefor.

In column 10, line 22, after "system" delete ..

In column 10, line 42, delete "44(i)" and insert - - 44(1) - -, therefor.

In column 10, line 44, delete "Ethemet" and insert - - Ethernet - -, therefor.

In column 10, line 60, after "has" delete ..

In column 10, line 65, delete "mns" and insert - - runs - -, therefor.

In column 11, line 2, delete "svstem" and insert - - system - -, therefor.

In column 12, lines 25–33, delete "If the I/O activity for the virtual service 60(1) continues to rise and the bandwidth used by the virtual service 60(1) exceeds a second threshold, the control subsystem 74 applies a second, more restrictive set of throttling actions to the requests for that virtual service. In this case, the throttling actions may include allowing only requests designated by the administrator as high priority, delaying requests designated as medium priority, and rejecting requests designated as low priority." and insert - - If the I/O activity for the virtual service 60(1) continues to rise and the bandwidth used by the virtual service 60(1) exceeds a second threshold, the control subsystem 74 applies a second, more restrictive set of throttling actions to the requests for that virtual service. In this case, the throttling actions may include allowing only requests designated by the administrator as high priority, delaying requests designated as medium priority, and rejecting requests designated as low priority. - -, therefor on line 26 as a new paragraph.

In column 12, line 25, delete "I/O" and insert - - I/O - -, therefor.

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UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 6,961,341

DATED : November 1, 2005

INVENTOR(S) : Krishnan

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 12, line 26, delete "vital" and insert -- virtual --, therefor.

In column 12, line 35, after "BT" delete "svstem" and insert -- system --, therefor.

In column 12, line 35, delete "bon" and insert -- born --, therefor.

In column 12, line 47, delete "exarnple" and insert -- example --, therefor.

In column 12, line 54, after "active list" insert --, --.

In column 13, line 2, after "registered" delete ..

In column 13, line 21, delete "bv" and insert -- by --, therefor.

In column 13, line 33, after "stores" delete ..

In column 13, line 42, delete "1i0" and insert -- I/O --, therefor.

In column 14, line 40, delete "9" and insert -- 9) --, therefor.

In column 14, line 40, after "ATQ" delete ..

In column 15, line 4, after "discussion" delete .. and insert --, --, therefor.

In column 15, line 10, delete "client).A" and insert -- client). A --, therefor.

In column 15, line 18, delete "ftmction" and insert -- function --, therefor.

In column 15, line 29, delete "(stel) 158" and insert -- (step 158 --, therefor.

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CERTIFICATE OF CORRECTION**

PATENT NO : 6,961,341

DATED : November 1, 2005

INVENTOR(S) : Krishnan

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 15, line 33, after "is" delete "..".

In column 15, line 37, after "compares the" delete "..".

In column 16, line 2, delete "perations" and insert -- operations --, therefor.

In column 16, line 3, delete "nd" and insert -- and --, therefor.

In column 16, line 40, delete "virual" and insert -- virtual --, therefor.

In column 16, line 42, delete "bv" and insert -- by --, therefor.

In column 16, line 54, after "(step" insert -- 170 --.

In column 16, line 55, after "measured" delete "..".

In column 16, line 56, delete "tile" and insert -- the --, therefor.

In column 16, line 63, delete "cf" and insert -- of --, therefor.

In column 17, line 22, delete "cofinuing" and insert -- continuing --, therefor.

In column 17, line 47, after "result" insert --, --.

In column 19, line 24, in Claim 13, after "that" insert --, --.

In column 20, line 21, in Claim 21, delete "form" and insert -- from --, therefor.

In column 20, line 38, in Claim 21, after "request" insert -- ; --.

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PATENT NO : 6,961,341

DATED : November 1, 2005

INVENTOR(S) : Krishnan

It is certified that error appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 20, line 45, in Claim 23, after "request" insert - - , - - .

In column 20, line 65, in Claim 24, after "request" insert - - , - - .

In column 20, line 66, in Claim 24, after "client process" insert - - , - - .

In column 21, line 6, in Claim 24, after "operations" delete ":" and insert - - ; - - , therefor.

In column 21, line 26, in Claim 25, delete "operatoin" and insert - - operation - - , therefor.

In column 22, line 21, in Claim 38, after "perform" insert - - the - - .

In column 22, line 48, in Claim 40, delete "requested" and insert - - request - - , therefor.

In column 22, line 65, in claim 44, after "request" insert - - , - - .

In column 23, line 25, in claim 45, after "second threshold" insert - - , - - .

In column 23, line 30, in claim 45, delete "server" and insert - - servers - - , therefor.

In column 23, line 41, in claim 46, after "request" insert - - , - - .

In column 24, line 51, in claim 48, delete "request" and insert - - requests - - , therefor.

In column 25, line 2, in Claim 49, delete "different" and insert - - differential - - , therefor.

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